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California ZEV Mandate

California's requirement that major manufacturers field a percentage of zero emission vehicles isn't dead.

The ZEV mandate is being re-worked, however, to stimulate the clean technologies available today.

February is the target date.

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Arnold Hosed – and You

Federal Stalling on Schwarzenegger's Greenhouse Emissions Waiver Prevents Launch of Alt Fuels Industry in California & Other States

Despite a pledge to act by year-end, the federal EPA is still stalling on the Clean Air Act waiver needed for California to implement its aggressive greenhouse gas emission reduction plan for cars.

The waiver is key to the birth of an alternative fuel and advanced technology vehicle industry in California and in states wishing to follow suit — New York, New Jersey and the New England states, Pennsylvania and Maryland, Oregon and Washington and, as of November 30, New Mexico.

“EPA is effectively preventing the birth of a real alt fuels industry,” says one veteran agency and clean fuels industry watcher in Washington.

The upshot, especially with Congress finally moving toward a genuine increase in national fuel economy minimums? It's still anyone's guess.

EVS-23 in Anaheim

Battery and Drivetrain Developers Believe Their Time Has Come
Electric vehicles appear to be entering an era of real commercial viability.

That was the mood at last week's EVS-23, the world EVs meeting, which according to the Electric Drive Transportation Association drew a record 1,500 to Anaheim, Calif. — half again as many as the last world meeting in the U.S. four years ago.

A combination of costly oil and fear of oil's effects makes electricity very attractive.

With wind or solar power, “The only source of *more on page 2*”



England's Moderc unveiled its new battery electric truck at EVS-23 in Anaheim last week

Hybrid Electrics, Hydraulics, Biomethane & More

More hybrid buses, of different types for London (with a target of 800 in service for the city's 2012 Olympics) is just one of the stories and trends to be explored in the **January 1** “look-ahead” issue of *Fleets & Fuels*.

Coca-Cola is committing to hybrids too, for delivery trucks, and FedEx Ground is to test hydraulic hybrid technology with pump/motors, hoses, fittings, valves, and controls by Parker Hannifin.

Most of the major automakers will have hybrid electric cars.



Ethanol for the coming year's Indy races and RNG5 biomethane will be covered too, as will the brand new ASTM spec for B20 biodiesel.

Don't forget propane/LPG, either. We won't.

Happy Holidays, and See You (Early!) Next Year



Electric Vehicles

A Record EVS-23 *(continued)*

carbon dioxide is the driver," said Modec chairman Jamie Borwick, who formally launched his made-in-England Modec battery electric truck at the show.

Vehicles at EVS-23 ranged from electric bicycles on up through neighborhood EVs, passenger cars and SUVs, to a Class 7 battery truck (Smith Electric Vehicles) and a hybrid school bus (Enova Systems).

EVS-23 featured numerous suppliers of lithium and other advanced batteries, all positing solutions to real and perceived problems of durability, reliability, safety and cost.

Ploughing Ahead

"If we waited until the battery was ready to develop the car we'd be waiting a long time," GM's Jonathan Lauckner said in a keynote address. GM clearly wants to be the first to market with a plug-in hybrid electric vehicle, but its "damn the torpedoes" posture is qualified by a sober, no-nonsense battery approach: GM is forcing the best in the business to compete, currently pitting A123's Nanophosphate brand lithium ion batteries against Compact Power's lithium ion manganese spinel for the E-Flex drive in the developmental plug-in Chevy Volt.

Battery leaders including Johnson Controls-Saft are vying for PHEV business at GM too.

Making history, Ford delivered a factory PHEV



EVS-23 saw the first delivery of a plug-in hybrid electric vehicle by a major OEM as Ford handed over the keys of an Escape Hybrid with lithium ion batteries to Southern California Edison. Present are Ed Kjaer of SCE, Sue Cischke of Ford, Lynda Ziegler of SCE, and Nancy Gioia of Ford.

at EVS-23, the first of 20 to be tested by Southern California Edison. Toyota brought PHEV versions of the Prius to the EVS-23 ride-and-drive (where their popularity meant their batteries were soon depleted).

"We want to make use of electrical energy to power the vehicles of the future," Toyota hybrid chief Koei Saga said in a keynote speech.

"All the alternative fuels face barriers."

Honda stood by its gaseous fuel guns at EVS-23, eschewing the plug-in trend and showing its latest hydrogen fuel cell vehicle, the FCX Clarity, which has a range of 270 miles using twin 5,000-psi H2 tanks.

A very limited number of three-year, \$600-per-month leases of the \$800,000 (widely reported) car will be available



in mid-2008. Honda said at EVS that California environmental leader Terry Tamminen is the third lessee of the existing FCX model vehicle.

EVS-23 drew 126 exhibitors. Its 1,500+ attendees came from upwards of 37 countries. Registrations for the pre-conference plug-in hybrid vehicle workshop had to be closed at 440 despite an extra fee of \$150.

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Volume 15, Number 1 will be dated January 1, 2008.

Subsequent 2008 issues will follow the regular Monday dating scheme: January 14, January 28, and so forth.

EVS-23 in Anaheim, California

Brits Bring Trucks

UK Manufacturers Display Battery Electrics, Smith Vows 10,000 Annual U.S. Units by 2010
England's Modec and Smith Electric Vehicles brought battery electric trucks to EVS-23, where Smith pledged production of 1,000 vehicles in California next year, 3,000 in 2009, and 10,000 per year by 2010.

Modec chairman Jamie Borwick said that the production goal for the Modec factory in Coventry, England is 750 vehicles in 2008. The firm uses a 70-kilowatt Zytec drive and is shifting for U.S. sales from MES-DEA's Zebra brand sodium nickel chloride batteries to lithium ion.



Smith brought its big Newton truck to EVS-23 but not the Ford Transit-based Edison van.

11¢ Per Mile

Smith is shifting from Zebra to lithium ion phosphate, and plans to build battery trucks using Czech Avia chassis, in Fresno, Calif., where room is being made in a plant formerly used to build aerial work vehicles.

Smith trumpeted operating costs as low as 11¢ per mile, and said its Enova-drive Newton trucks are available as Class 5, 6 or 7 vehicles. Smith earlier this year unveiled the Edison, which is based on Europe's popular Ford Transit van. Despite plans revealed this past summer, U.S. licensing requirements restrict the Edison to the European market, Smith said last week.

Modec (U.S.), William Doelle, 313-492-8236;
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Smith (UK), Kevin Harkin, +44-845-1557-755;
kevin.harkin@smithelectricvehicles.com;
www.smithelectricvehicles.com

Valence Launches Large-Format Epoch

Valence (NASDAQ:VLNC) trumpeted improved electronics and a new brand name for its lithium ion phosphate batteries, deeming the Epoch brand package to be the "next era of large-format, lithium-ion battery technology."

The new Epoch batteries include built-in management and monitoring hardware to help "move the electric vehicle industry one step closer to the Holy Grail — finding a battery solution that is safe, intelligent, lasts longer and weighs less than outdated technologies being used today," according to a company release.

"We believe the Epoch brand of battery systems will serve as the cornerstone of an era when lithium-ion battery chemistry... is efficient, safe, reliable, powerful and widely-used," said Bob Kanode, president and CEO of Austin, Texas-based Valence. Epoch brand customizable battery



Raser-FEV-Electrovaya Drive Team

Utah's Raser Technology and Detroit's FEV said they will integrate Raser's Symetron electric motor and power electronic drive powertrain technology into a new hybrid drive for a plug-in hybrid electric demonstration vehicle.

Raser had previously announced an agreement with "an undisclosed global automotive manufacturer." The expected demonstration vehicle has a fuel economy of goal of approximately 100 mpg. "We look upon this project as an opportunity to demonstrate powertrain innovation," FEV U.S. operations president Gary Rogers said in a release. The companies said they're baselining lithium ion batteries from Electrovaya (page 4). Raser, VP Jim Spellman, 801-765-1200;

jim.spellmant@rasertech.com; www.rasertech.com
FEV, Steve Kraemer,

248-373-6000; kraemer@fev-et.com; www.fev.com



Raser's P-100

AC Promotes V2G as EV Key

Stalwart AC Propulsion insists that battery electric vehicles are the answer for transportation, in no small part because of their suitability for vehicle-to-grid systems. V2G allows vehicles that have charged cheaply at night to voluntarily return electricity to the grid in times of high demand.

Large numbers of EVs will help utilities manage peak power challenges and perhaps even avoid building new capacity. Engineering the two-way meters and protocols necessary to make V2G work is challenging but may someday even provide a revenue source for EV owners who charge at night and relinquish power by day, AC says.

AC is working on V2G with organizations including the Federal Energy Regulatory Commission and PJM Interconnection, a regional transmission organization (RTO) coordinating wholesale movements of electricity. AC Propulsion, president Tom Gage, 408-616-0573; tgage@acpropulsion.com; www.acpropulsion.com



AC Propulsion's eBox

packs will be available in 12.8 volt and 19.2 volt modules and allow scalability up to 390 kilowatt-hours.

The 12.8-volt E24 module has capacity for 1,280 watt-hours and weighs 15.8 kilos (watt-hours/kilogram = 81).

Valence batteries are being used on hybrid electric buses for Transport for London with Enova drivetrains (F&F, November 26).

"Valence could well set the standard for EV fleet vehicles in several European markets during 2008," Kanode said. "We would hope to see the same type of market traction and excitement in U.S. markets in the near future."

Valence promoted a new battery charge indicator too. Valence (Texas), president Bob Kanode, 512-527-2900; rlk@valence.com; www.valence.com

Valence (Northern Ireland), VP Alastair Johnston, +44-2890-845405; fax +44-2890-838912; alastair.johnston@valence.com

EVS-23 in Anaheim

Adventec Manufacturing

Tier 2 component supplier Adventec Manufacturing of Ancaster, Ont. made its first EVS appearance last week, promoting ultrasonic welding capabilities and a wide range of parts needed for mass production of lithium and other advanced batteries. "We lend the practical, component-level expertise these companies need," Adventec president Jim Campbell said of the numerous battery developers at the show. "They all need to connect those cells," he told *F&F*, emphasizing that Adventec's precision injection-molded, machined and stamped relays and switches are suitable for any battery chemistry.

The 60-employee firm, which has annual sales of about \$7 million, initially got into batteries with the new-defunct Avestor, which long promoted lithium polymer batteries and in its final iteration was a partnership of Kerr-McGee and Canada's Hydro-Québec utility.

Adventec president Jim Campbell, 905-648-3345, ext 234;

jcampbell@adventec.com; www.adventec.com

TM4's Mocav Drive

Quebec's TM4 promoted its 42-kilowatt, Mocav brand DC-DC inverter-based drivetrain with high-efficiency, 550-Nm continuous torque (equal to 406 foot-pounds at 610 rpm) motor. The Mocav motor and generator combination weighs just 176 pounds (80 kilograms).

TM4 offers compact motors and generators based on a proprietary inverted rotor design, available in both axle and wheel-motor configurations.

TM4 has been the supplier of drivetrains to France's Cleanova/SVE (*Société de Véhicules Électriques*), which sent



several delegates to EVS-23. SVE last week trumpeted a new French government allowance applicable to the Cleanova drivetrain, a series design with an optional range-boosting engine feature (*F&F Strategies*, June 25).

TM4, Patrice Dupont, 450-645-1444, ext 238;

patrice.dupont@tm4.com; www.tm4.com

SVE, Sébastien Rembauville-Nicolle, +33-6-7351-7988;

sebastien.rembauville@cleanova.com; www.cleanova.com

Johnson Controls – Saft

"Could there be a more powerful combination?" asks a Johnson Controls – Saft brochure.

Be that as it may, the battery joint venture emphasized its expertise in lithium ion and other battery technologies, as well as both air- and water-cooled battery packs. On show in Anaheim was a lithium ion battery system suitable for plug-in hybrid electric vehicles.

Johnson Controls–Saft also promoted its expertise in battery management systems, and in a design structure for high energy lithium ion cells that effectively separates the cells in the event of a thermal event, i.e. fire.

Johnson Controls – Saft, Don Berg, 414-524-2600;

donald.f.berg@jci.com; www.johnsoncontrols.com

eVionyx & Xellerion – Nickel Zinc

"Why nickel zinc now?" asked eVionyx–Xellerion at EVS-23, answering the question by stating that the venerable battery technology is cheaper and safer than the advanced batteries driving the EV discussion today. The Hawthorne, N.Y.-based company promoted different sizes of its Xellerion brand nickel zinc batteries suitable for a range of small EVs, and for stationary applications.

"The chemistry is inherently more stable," said business development manager Rayan Faris. She pegged the cost of her batteries at about \$400 per kilowatt-hour, and said there is generally no need for liquid cooling.

eVionyx–Xellerion, Ms Rayan Faris, 646-539-3900;

rfaris@reveo.com; www.reveo.com

ExxonMobil-Tonen

ExxonMobil Chemical executives were busy at EVS-23 promoting a microporous membrane film, produced in numerous custom forms in league with inventor Tonen, they say improves the safety and performance of advanced batteries, especially lithium batteries (*F&F*, May 21).

A lithium ion battery by Electrovaya was displayed.

Making the rounds for ExxonMobil were microporous films business manager Mike Lesniewski and Andrew Malkin, the Japan-based president of Tonen Specialty Separator Godo Kaisha. They noted a new MoU to expand production to Korea and possibly establish a battery test center there; a Reuters report late last month said ExxonMobil would invest some \$322 million in a battery plant in Gumi, south of Seoul.

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fax -287-39-1861; andrew.a.malkin@exxonmobil.com

ExxonMobil, Mike Lesniewski, 315-966-1031;

michael.lesniewski@exxonmobil.com; exxonmobil.com

Azure Shuttle Completes Altoona Tests

Azure Dynamics (Toronto:AZD) reported successful completion of durability trials at the federal bus certification test facility in Altoona, Pa. — qualifying Azure's gasoline-fueled series hybrid drivetrain for FTA-supported bus purchases by U.S. transit agencies.

"This test demonstrates, on an accelerated time frame, the ability of Azure's hybrid system to withstand the rigors of operating in a demanding urban transit bus environment for seven years," said Azure CEO Scott Harrison. Azure reported late last month that its facility outside Vancouver has been certified to the ISO 9001:2000 quality management system standard.

Azure, VP Dean McGrew, 781-932-9009;

dmcgrew@azuredynamics.com; azuredynamics.com

Yazaki Ties the EV Together

Yazaki, a regular EVS exhibitor, promoted its range of indispensable EV cables and connectors in Anaheim. A



DC-DC converter connector is shown.

Yazaki North America, Jon Jarrett,

734-983-2712; jon.jarrett@yazaki-na.com;

www.yazaki-na.com

EVS-23 in Anaheim

Zytek Drive for Daimler's Smart...

Britain's Zytek noted Daimler's use of a 35-kilowatt (peak) DC drive that bolts onto the existing Getrag transmission of a Smart Fortwo car, making the vehicle into a full battery electric. Daimler is testing 100 cars in Britain with Zebra sodium nickel chloride batteries and is contemplating further trials on the European continent.



Zytek drive for Smart Fortwo

Sharing the Zytek display was Britain's Elektromotive, which is promoting slim and attractive public charging units with microprocessor controls allowing for a wide range of charging protocols — and billing options. Elektromotive's "Elektrobay" is described as "a stylish and durable piece of street furniture."



Elektromotive's svelte Elektrobay and Smart Fortwo at EVS-23

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Daimler/Smart, Pitt Moos, +49-70-31-90-44962; peter.moos@smart.com; www.smart.com

Elektromotive, Greg Simmons, +44-1273-704775; greg@elektromotive.com; www.elektromotive.com

...as Daimler Looks Ahead to More FCVs

Daimler is eyeing as many as 350 new F-Cell cars for trials in 2010 (F&F, October 22), targeting single-fill range of greater than 400 kilometers, or 250 miles, as the automaker moves to three 700 bar/10,000-psi hydrogen fuel tanks, said Ronald Grasman, strategic energy projects manager for fuel cell market development.

The new Daimler F-Cells, to be based on the Mercedes B-Car platform, are expected to have 85-kilowatt fuel cell systems, with cells supplied by the new Automotive Fuel

Cell Cooperation, the former Ballard automotive fuel cell operation in which Daimler is taking a majority stake (F&F, November 26).

Daimler's existing fleet of approximately 60 F-Cells deployed worldwide is based on the A-Class Mercedes. The existing F-Cells have 60-kilowatt drives, and 5,000-psi hydrogen storage yielding range of 180 to 200 kilometers.

Daimler also showed a hybrid sedan with Bluetec diesel engine.

Daimler, Ronald Grasman, +49-7021-893474; fax +49-7021-893423; ronald.grasman@daimler.com; www.daimler.com



Daimler trumpeted nearly 2.4 million miles logged worldwide by some five dozen F-Cell cars based on the Mercedes A-Class, and confirmed at EVS-23 that it plans to field B-Class F-Cell cars with 10,000-psi hydrogen tanks in 2010.

Electrovaya

Canada's Electrovaya (Toronto:EFL) promoted its SuperPolymer brand lithium ion battery prowess at EVS-23, including a new, intelligent battery management system available in 15- and 48-volt configurations and suitable for integrated systems up to 710 volts.

"The iBMS is an integrated, CAN-bus solution with fail-safe capabilities," the company said.

Built-in iBMS electronics provide for cell equalization during charge and use, as well as diagnostics for over- and under-current situations, and even leak detection.

Electrovaya noted in Anaheim that early this year it added MN-Series chemistry to an existing roster of phosphate- and cobaltate-series batteries.

"The MN-Series is Electrovaya's preferred chemistry for transportation," the company said, "because it offers up to 50% higher energy density with comparable safety characteristics to its phosphate-series offerings."

Electrovaya, Ms. Gitanjali DasGupta, 905-855-4610, ext 3002; gdasgupta@electrovaya.com; www.electrovaya.com

EVs in Geneva This Coming March...

March 11-13, EET-2008, the 3rd European Ele-Drive Transportation Conference. Organized by AVERE, the European Association for Battery, Hybrid and Fuel Cell Electric Vehicles, in cooperation with the **International Advanced Mobility Forum** in conjunction with the 78th **Geneva International Motor Show** at the Palexpo Center in Geneva, Switzerland.

On the Way to Sustainable Development and Market Opening theme.

AVERE (Brussels), Frederic Vergels, +32-2-629-2363; fax -2-629-3620; avere@vub.ac.be; www.ele-drive.com

...EDTA 2008 in Washington...

December 2-4, 2008, Powering Sustainable Transportation Battery, Hybrid and Fuel Cell Electric Vehicle Conference



& Exposition, at the Washington Convention Center in Washington, D.C. Organized by the Electric Drive Transportation Association (the EVS-23 host last week). EDTA, Michelle Harris, 202-408-0774; fax 202-408-7610; mharris@electricdrive.org; www.electricdrive.org

...EVS-24 in Stavanger, Norway in 2009

May 13-16, 2009, EVS-24, the world electric vehicles meeting. Stavanger, Norway.

Organized by AVERE, the European Association for Battery, Hybrid and Fuel Cell Electric Vehicles.

Abstracts for EVS-24 technical papers due **November 1, 2008**.

AVERE (Brussels), Frederic Vergels, +32-2-629-2363; fax -629-3620; avere@vub.ac.be; www.evs24.org

[More Events Listings on Page 9](#)



EVS-23 in Anaheim

EnerDel Prius Is NREL-Bound

Indianapolis-based EnerDel billed itself as the only American lithium ion manufacturer, and showed a Prius it's fitted with its batteries for testing by the National Renewable Energy Laboratory — per-gallon mileage is expected to be doubled. EnerDel, which through its parent Ener1 is partially owned by Delphi, promotes nanophase lithium titanate batteries with high voltage nickel-manganese cathodes for hybrid applications. Its pack for Prius boasts double the energy density of the manufacturer's nickel metal hydride battery packs by Panasonic EV.

EnerDel offers batteries for pure EVs too, and says its recent \$70 million contract with Norway's Think is the largest recorded lithium ion battery contract to date.

EnerDel, CEO Ulrik Grape,

317-585-3443; ugrape@enerdel.com; www.enerdel.com

EnerDel, COO Mr. Naoki Ota,

317-585-3446; fax 317-585-3444; nota@enerdel.com

Enova

Enova Systems promoted its wide range of hybrid and battery drivetrains solutions at EVS-23, showing new pre- and post-transmission designs, displaying a plug-in hybrid electric school bus by International/IC, and reporting that it expects to deliver 300 90- and 120-kilowatt drivetrains to Smith Electric Vehicles/Tanfield by year-end.

Enova can supply small-battery charge-sustaining drives, or large-battery designs for charge-depletion. Post-transmission parallel drives will be supplied to an Asian medium truck OEM and will be available for U.S. retrofits next year.

"We can also do a pure electric," said global sales and marketing director Terry Romano.

Enova, Mr. Terry Morano, 310-527-2800, ext 156;

tmorano@enovasystems.com; www.enovasystems.com



EnerDel has re-powered a Prius with a lithium ion pack



A123Systems showed its 'Nanophosphate' brand lithium ion batteries for products ranging from DeWalt power tools (inset) to new high-end drives for BAE Systems-powered hybrid buses and GM's Chevy Volt plug-in

Maxwell-Lishen Team for Energy Storage

San Diego-based Maxwell (NASDAQ:MXWL) is talking up an alliance with China's Tianjin Lishen Battery "to manufacture and market novel 'hybrid' energy storage products combining the companies' respective ultracapacitor and lithium battery technologies." Maxwell said it sees "a large market opportunity for products that leverage the complementary strengths of double-layer capacitor and lithium ion" battery designs.

"We believe that the products we envision will give end-users the best of both worlds in terms of the long cycle life, rapid charge/discharge characteristics and low temperature performance of ultracapacitors and the large energy storage capacity of lithium-ion batteries," said Maxwell president and CEO David Schramm. Tianjin Lishen is China's leading producer of rechargeable lithium ion batteries, Maxwell says.

Maxwell (San Diego), Bobby Maher, 858-503-3331;

bmaher@maxwell.com; www.maxwell.com

Magna Steyr from Austria

Magna Steyr displayed a new lithium ion drivetrain in a Mercedes sedan, and said the design is scalable up to 200 kilowatts, making it suitable for transit bus and refuse truck applications. The Austrian firm has worked with batteries from Saft and is now favoring A123 as a supplier, said product manager Peter Pichler.

Magna Steyr, Dr. Peter Pichler,

+43-664-8840-6579; fax +43-316-404-3979;

peter.pichler2@magnasteyr.com; www.magnasteyr.com

There's Room for NiMH, Says Nilar

Colorado's Nilar promoted its high-power membrane nickel metal hydride batteries at EVS-23. The firm acknowledged that it's bucking the lithium ion trend, but said that if the automakers go forward with electric drive vehicles the way they say they will, there will be plenty of battery business too go around.

Nilar, Richard Howlett, 303-662-8891; fax 303-662-0128;

rhowlett@nilar.com; www.nilar.com

Panasonic, the Hybrid Battery Leader

Panasonic, with its supply position for Toyota and Honda hybrids, is the indisputable leader in batteries for commercially produced hybrid electric vehicles.

The company showed large prismatic nickel metal hydride battery packs for the Chevy Tahoe and Lexus LS 600h hybrids at EVS-23, as well as components including film capacitors for hybrid electric vehicles and the integrated inverter type of electrically driven coolant compressor shown here.



Panasonic offers lead acid, lithium ion and other chemistries in addition to its hybrid market-leading NiMH batteries.

Panasonic (tech), Duncan Bullock, 248-447-7053;

bullockd@us.panasonic.com

Panasonic (sales), Gary Nelson, 248-447-7128;

nelsong@us.panasonic.com; www.peve.jp/e

EVS-23 in Anaheim

Project Better Place

\$200 Million for New Organization

Trumpeting Cellular Model for EVs

One of the more intriguing items at EVS-23 was a treatise by software millionaire Shai Agassi likening the transition needed for viable electric vehicles to the past decade's embrace of the cellular telephone.

EV drivers stand to spend far less money on electricity than today's drivers spend on fuel, Agassi notes.

He wants to capitalize on that potential economic windfall.

Agassi has just established Project Better Place, which seeks to apply some \$200 million to create a truly viable EV infrastructure. His vision includes the battery as part of the infrastructure, much the way that a cell phone's SIM card is part of the communications grid.



Shai Agassi

"We believe that we can integrate existing technologies," Agassi says, "as we build out electric recharge grids much like the cellular industry in the early days of building cell towers."

"We need to change the way consumers buy an EV so that it fits the current social contract we have with our cars, providing a normal car ownership experience even if the car has an electric drive."

"The solution does not stem from a more powerful battery," Agassi says.

"Rather we propose the creation of a ubiquitous infrastructure that can enable a car to automatically charge up its battery when parked" — and swap the batteries when more "fuel" is needed for an exceptionally long drive. "We for the first time look at the car battery as part of the infrastructure system, not part of the car."

Commit to Buy Electricity... and the Car is Free

How profound might this change be? Cars could have so much value as peak-leveling devices to utilities that, like cell phones today for customer's committing to multi-year contracts, vehicles could someday be given away. "Once a grid is installed to the degree of sufficient ubiquity in a contained region, car owners will be able to subscribe to a complete commute solution," Agassi says — "car, energy and maintenance contained in a single predictable monthly price..."

"As the costs of battery and clean electricity will continue to decline over the next ten years, we can easily foresee enough subsidies in the contract to the

point where *electric vehicles will be given for free to long-term subscribers.*

"Assuming that subscribers will be happy to pay the same amount they pay for fuel and maintenance today, *the economics require a contract lasting six years in order to get a free SUV*" (emphases added).

By 2020 it should only take three years, Agassi maintains.

"Such radical process has happened before," Agassi says, "in the wireless phone industry, where it is almost expected today that a basic handset will be handed for free with any new subscription."

Project Better Place, Aliza Peleg, 650-714-4788;

aliza.peleg@betterplc.com; www.projectbetterplace.com

Amulaire's Cooler Cooling

"The new shape of thermal management," says San Diego-based Amulaire, which offers a line of multi-geometry, high-surface area heat-dissipation products that can reduce the size, weight and complexity of electronic components for electric drive vehicles.

Amulaire products could be seen on devices by **Infineon Technologies** and Rinehart Motion Systems at EVS-23.

Amulaire, Dave Bono, 858-309-4717; fax 858-481-6817;

daveb@amulaire.com; www.amulaire.com

Rinehart Motion & Apex Drive Labs

Oregon's Rinehart Motion Systems promoted its custom power electronics, sharing booth space with Apex Drive Laboratories. Apex unveiled a new line of DDS² brand direct-drive (wheel motor) systems for EVs.

Rinehart Motion, president Larry Rinehart, 503-344-5085;

larry@rinehartmotion.com; www.rinehartmotion.com

Apex, CEO Michael Baker, 503-863-5985;

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T3 Motion Trikes to the Streets



T3 Motion showed its striking electric three-wheelers aimed at police and private security markets. The U.S.-made T3s have a turn radius of zero (they pivot), and are designed with swappable battery packs to minimize downtime. They have belt drives with drive

belts supplied by Gates, and run on 10¢ *per day*. And, in the true spirit of EVS-23, "We've sold hundreds and we expect to sell thousands next year," said T3 president Neil Brooker. *T3 Motion, president Neil Brooker, 714-619-3600, ext 108;*

nbrooker@t3motion.com; www.t3motion.com

50.5¢ Per Mile for 2008

The U.S. Internal Revenue Service is raising the national per-mile business driving rate to 50.5¢ for 2008 — a boost of 4.1% from 48.5¢ cents in 2007. Rationale and historical perspective in the **January 1** issue of *Fleets & Fuels*.

Watch for a Runzheimer run-down of the least and most expensive to operate U.S. vehicles too.

www.FleetsandFuels.com

Strategies

California ZEVs and More

State's Zero-Emissions Vehicle Program Is Honed, Joined by Numerous Other Clean Vehicle Efforts

As the U.S. Senate this week prepares to vote on an energy bill that includes a fleet-wide increase in vehicle fuel economy to 35 mpg by 2020 (the Senate is *not* expected to go along with the version passed by the House), California is marching forward on its own.

The state has enacted legislation and promulgated rules aimed at slashing greenhouse gas emissions and boosting the use of renewable and alternative fuels, and has allotted more than \$1 billion for the development programs to make it real.



“Emissions need to be reduced by 80% or more,” California Air Resources Board executive officer James Goldstene said at EVS-23. CARB’s Zero-Emission Vehicle (ZEV) regulation, which is to be modified in February, has pushed advanced technology vehicles with zero or near-zero emissions, he said, and is going to bring additional benefits.

“These same advanced technologies will also factor into the solution for global warming,” he said.

Over the years, changes to much-modified ZEV mandate have resulted in fewer pure-ZEV or “gold” vehicles, and more partial-ZEV “silver” and “bronze” vehicles. February is expected to see a swing back toward batteries, as fuel cell vehicles are seen as further off than envisioned during the 2003 ZEV review. The new proposal, based in part on an independent expert

CEC to Name Key People

The California Energy Commission should announce in the next couple of weeks the members of an advisory board it’s establishing to oversee the state’s new alternative fuel and vehicle funding program, AB 118 (*F&F*, Oct. 22).

California industry reps and advocates are lining up to join. The board will include fuel and vehicle technology consortia, as well as labor, environmental, community-based justice, public health and consumer organizations. Academics, workforce training groups, private industry and even recreational boaters are to be represented.

AB 118 will provide up to \$1.5 billion in incentives for innovative technologies and alternative fuels over seven-and-a-half years to foster vehicles meeting the state’s air quality, petroleum reduction and greenhouse gas goals.

CEC will shell out approximately \$120 million yearly, while the California Air Resources Board will ante about \$80 million in program support, per year.

CEC lawyers are said to be drawing up a charter precluding advisory board members from applying for funds. CEC, Susan Brown, 916-654-4741;

sbrown@energy.state.ca.us; www.energy.ca.gov



California Gov. Arnold Schwarzenegger is looking to drive change

panel report, is also designed to provide more compliance flexibility and to simplify the regulation.

CARB is expected to require the six major car OEMs each to produce their market share of 2,500 ZEVs — just 10% of the original 2012-2014 fuel cell requirement of 25,000 vehicles. Under the new proposal they could provide fuel cells or battery EVs — an attempt to level the playing field between the two gold technologies.

“Fuel cells are ready for a larger demonstration,” Goldstene said.

“It’s been a challenge for ARB to find the balance.”

90% Alt Fuels in California?

To fill the gap between 2,500 and 25,000 gold cars, automakers will be able to produce cars that meet a new “silver+” category: plug-in hybrids and hydrogen ICE cars. The silver+ category appears to be a nod to GM, which has promised to bring to market its Chevy Volt as early as 2010, contingent on battery technology.

At EVS-23, GM trotted out two lithium ion battery makers — A123 Systems teamed with Continental, and LG Chem teamed with Compact Power — vying for the supplier slot. GM plans Volt “mules” in Chevy Malibu sedans in testing rounds this spring.

There are more than one million bronze vehicles and 200,000 silver vehicles on California’s roads. But they’re still a mere fraction of the 1.9 million vehicles sold every year in the state. Goldstene laid out an eye-opening scenario of what could be necessary to meet the state’s ambitious greenhouse gas reduction goal of 80% below 1990 levels by 2050: just 11% of vehicles fueled by gasoline or diesel, the rest using biofuels, electricity or (renewably derived) hydrogen.

Meanwhile, the state’s vehicle greenhouse gas regulation passed in 2004 awaits a U.S. EPA waiver and must still overcome an automaker court challenge. A federal judge in Fresno could rule any time on motions for summary judgment.

CARB, James Goldstene, 916-445-4383; jgoldstene@arb.ca.gov

CARB (ZEVs), Analisa Bevan,

916-323-8966; bevan@arb.ca.gov; www.arb.ca.gov

Publications

'Ten Million Problems'

The *New York Times* late last week presented a harrowing report on trucks in China, where artificially low diesel prices seen as necessary to support the economy result in fuel with hundreds of times the sulfur content allowed in the U.S. Truckers in China, Keith Bradsher reported, tend to use the cheapest fuel, which is most often the dirtiest.

Even China's newer trucks come nowhere near meeting the latest international standards, and new truck buyers in areas that do face regulation, says the report, are able to pay "fees" to dealers for cheaper trucks with less emission controls. Operators of trucks with controls often ruin the equipment by using sulfur-laden fuel.

2,000 PPM

"The United States allows maximum sulfur concentrations of just 15 parts per million for most diesel fuels, while China allows up to 2,000 parts per million," Bradsher reported.

The result is a choking pall of soot along the roadways of scores of major industrial cities.

"The 10 million trucks on Chinese roads, more than a quarter of all vehicles in this country, are a major reason that China accounts for half the world's annual increase in oil consumption," Bradsher writes. "Sating their thirst helped push the price of oil to nearly \$100 a barrel this year, before a recent decline, and has propelled China past the United States as the world's largest emitter of global-warming gases."

Grasping the China Market

'Get Your Arms Around' China, Says J.D. Power

By 2012, average China-based revenues among the Top 50 automotive component companies in China are forecast to reach \$1.08 billion per year, a 95% increase over 2006, says J.D. Power's Bangkok-based Automotive Resources Asia unit, which is offering an in-depth *China Automotive Components Outlook* report for \$7,500 U.S. "China's automotive component sector is in the midst of a massive transformation," Power says. "At the heart of the transformation is a blistering demand for new vehicles and an increase in local vehicle production to meet that demand.

"Vehicle sales in China grew from 2.8 million units in 2002 to 8.2 million units in 2007, making China the second largest vehicle market in world... an estimated 30% of the value of the component production in China today is exported." Power offers background on the Chinese market based on 15 years of tracking the country, and ranks the top 50 automotive component manufacturers while covering the products they make, and their strategies for growth.

Automotive Resources Asia/J.D. Power (Bangkok),

John Bonnell, +66-2-264-2050; fax -2051;

john.bonnell@auto-resources-asia.com;

www.auto-resources-asia.com

Emerging Giants

China Automotive Components Outlook



Events

Challenge X & EcoCAR

Final Challenge X Competition is Slated for May, New EcoCAR Teams Are Sought for Autumn 2008

The Department of Energy (Argonne National Lab) and General Motors will hold their Challenge X coast-to-coast *Crossover to Sustainable Mobility* competition May 12-May 21 in New York City, Millville, N.J., Philadelphia, Baltimore, and Washington. DoE and GM are launching a new EcoCAR competition ([link to PDF](#)) to replace Challenge X as of fall 2008.

EcoCAR team proposals are being invited with a submission deadline of March 3.

Argonne, Kristen De La Rosa, 512-323-0587;

kdelarosa@anl.gov; www.challengex.org

Discount Ends This Friday!

A registration discount of up to \$500 for Auto FutureTech in Vancouver ends this Friday, December 14.

Auto FutureTech is being held March 12-14 at the Vancouver Convention & Exhibition Centre in Canada.

Auto FutureTech is part of GLOBE 2008 YR10, the Tenth Biennial Trade Fair and Conference on Business and the Environment.

Both are organized by Vancouver's Global Opportunities for Business in the Environment — the GLOBE Foundation.

GLOBE/Auto FutureTech, Carine Vindeirinho,

604-775-7300 or toll-free 800-274-6097;

info@autofuturetech.com; www.autofuturetech.com

Coming Up Fast!

February 20-22, CHDV 2008, the Clean Heavy-Duty Vehicles Conference. San Diego Hilton Resort on Mission Bay in San Diego, Calif. Sponsorship opportunities available. Calstart, Debby DuBose, 626-744-5653; ddubose@calstart.org; www.calstart.org

Two for 2008 by eyefortransport

February 19-21, Green Transportation & Logistics World Summit at the Marriott Hotel in Zurich, Switzerland.

www.greenlogisticsforum.com



March 26-27, 2nd Effective Fuel Management for Fleets conference. Omni Resort in Orlando, Fla.

eyefortransport (London),

Katharine O'Reilly, +44-20-7375-7207

or U.S. toll-free 800-814-3459, ext 329;

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Meetings!!

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